

# PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C.20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 16 March 2000 (16.03.00)	
<b>International application No.</b> PCT/NZ99/00112	<b>Applicant's or agent's file reference</b> JI 210588/142
<b>International filing date</b> (day/month/year) 23 July 1999 (23.07.99)	<b>Priority date</b> (day/month/year) 24 July 1998 (24.07.98)
<b>Applicant</b> LITTEK, Arnim	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

22 February 2000 (22.02.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland	<b>Authorized officer</b>  Juan Cruz
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ 99/00112

**A. CLASSIFICATION OF SUBJECT MATTER**Int Cl<sup>6</sup>: H01L 41/047, 41/083, 41/113

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

Int Cl<sup>6</sup>.: H01L41/047, 41/053, 41/083, 41/113, 41/26, G01D 5/14, G01L 1/16, H04R 17/00, A61B 5/103, 5/02, (G01B 7/- and 101:20)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CL PATENTS on Questel: Int. Cl.<sup>6</sup> as above, piezoelectric+, piezo (W) electric+, electrode+, offset, overlap+, spac+, zigzag, zig (W) zag, interdigit+, cut, cutting, clamp+, clip+, sheet?, monitor+, patient?, infant?**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Patent Abstracts of Japan, JP 09-331685 A (SERA TEC:KK) 22 December 1997 Abstract; drawing	1, 2, 5
X	Patent Abstracts of Japan, JP 08-222777 A (STAR MICRONICS CO LTD) 30 August 1996 Abstract; drawing	1, 2, 5
X	US 5448996 A (BELLIN et al.) 12 September 1995 Figure 2; column 3, lines 47 - 61	1, 2, 5, 6

☒ Further documents are listed in the continuation of Box C☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 30 November 1999	Date of mailing of the international search report 23.12.99
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized officer <b>RAJEEV DESHMUKH</b> Telephone No.: (02) 6283 2145

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ 99/00112

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4638206 A (TSUNOOKA et al.) 20 January 1987 Figures 1, 3; column 2, lines 20 - 40	1 - 6
X	US 4509527 A (FRADEN) 9 April 1985 Figures 3 - 6; column 4, line 52 column 5, line 36	1, 2, 5, 6
X	US 4376302 A (MILLER) 8 March 1983 Figures 1, 2; column 2, lines 5 - 33	1, 2, 5, 6
A	US 4359726 A (LEWINER et al.) 16 November 1982 Figure 1; column 2, lines 46 - 49	1 - 6

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ 99/00112

**Box I** Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

**Box II** Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please see the extra sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1 - 6

**Remark on Protest**

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ 99/00112

## Continuation of Box II

According to PCT Rule 13.1, the international application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept.

The present application has four groups of claims each characterised by its own set of special technical features. The expression "special technical features" means those technical features which each of the claimed inventions, considered as a whole, makes over the prior art.

Claims 1 - 6 define a transducer comprising a piezoelectric member. The special technical feature of these claims is that the electrodes are offset so as to provide one or more regions in which the electrodes do not overlap.

Claims 7 - 10 define a transducer comprising a piezoelectric member. The special technical feature of these claims is a clamp for releasably securing the electrodes on each side of the piezoelectric member.

(Claim 11 is appended to any of claims 1 - 10.)

Claims 12 - 17 define a method of shaping a transducer. The special technical feature of these claims is the step of manually cutting the transducer to a desired shape and size.

Claims 18 - 19 define a method of monitoring a subject. The special technical feature of these claims is the step of analyzing the vital signal information to determine the complexity (e.g. determining the fractal dimension) of the vital sign information.

There is no technical relationship among these inventions involving one or more of the same or corresponding special technical features. Therefore the requirement of unity of invention referred to in PCT Rule 13.1 has not been fulfilled.

In spite of there being four different inventions, it was considered by the searching authority that the search strategies for the first two groups of inventions would have partially overlapped at least in so far as that each group of claim involves an arrangement of electrodes in a piezoelectric transducer. However each of the other two groups of inventions would have required searches which would be distinct from any search done for the first two groups of inventions, and also from any search required for the remaining group of inventions. Therefore, instead of inviting the applicant to pay three additional search fees (because there are four groups of inventions), the searching authority invited the applicant to pay two additional search fees (because it was expected that three distinct searches would have been required for the four groups of inventions).

D Four Paragraphs

18.07

Page 18-3.

(73  
324)

Method of Modified  
Piezo for the  
electrode

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
PCT/NZ 99/00112

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
US	4638206	EP	165886	JP	61002376	DE	3575603
US	4509527	GB	2138144	FR	2544074		
US	4359726	EP	34077	FR	2475804	DE	3161056
		US	RE32180				
END OF ANNEX							

# PATENT COOPERATION TREATY

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BALDWIN SHELSTON WATERS  
PO Box 852  
WELINGTON  
New Zealand

**PCT**

NOTIFICATION OF TRANSMITTAL OF  
INTERNATIONAL PRELIMINARY EXAMINATION  
REPORT

(PCT Rule 71.1)

Date of mailing  
day/month/year

**19 JUN 2000**

Applicant's or agent's file reference

JJ210588/142

**IMPORTANT NOTIFICATION**

International application No.  
**PCT/NZ99/00112**

International filing date  
23 July 1999

Priority date  
24 July 1998

Applicant

**MED-DEV LIMITED et al**

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translations to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide

Name and mailing address of the IPEA/AU

AUSTRALIAN PATENT OFFICE  
PO BOX 200, WODEN ACT 2606, AUSTRALIA  
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Authorized officer

**RAJEEV DESHMUKH**

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**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference JI210588/142	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International application No. <b>PCT/NZ99/00112</b>	International filing date ( <i>day/month/year</i> ) 23 July 1999	Priority Date ( <i>day/month/year</i> ) 24 July 1998
International Patent Classification (IPC) or national classification and IPC  <b>Int. Cl. <sup>7</sup> H01L 41/047, 41/083, 41/113</b>		
Applicant <b>MED-DEV LIMITED et al</b>		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of 4 sheets, including this cover sheet.  <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  These annexes consist of a total of 7 sheet(s).
3.	This report contains indications relating to the following items:  I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 23 February 2000	Date of completion of the report 9 June 2000
Name and mailing address of the IPEA/AU  AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer  <b>RAJEEV DESHMUKH</b>  Telephone No. (02) 6283 2145



**I. Basis of the report**

1. With regard to the **elements** of the international application:\*
- ☐ the international application as originally filed.
- ☒ the description, pages 3 - 14 as originally filed,  
pages , filed with the demand,  
pages 1, 1a, 2 received on 7 June 2000 with the letter of 7 June 2000
- ☒ the claims, pages , as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages 15 - 18 received on 7 June 2000 with the letter of 7 June 2000
- ☒ the drawings, pages 1/6 - 6/6 as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of
2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.  
These elements were available or furnished to this Authority in the following language which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, was on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be nonobvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos: 7 - 22

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claim Nos. 7 - 22

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1 - 6	YES
	Claims	NO
Inventive step (IS)	Claims 1 - 6	YES
	Claims	NO
Industrial applicability (IA)	Claims 1 - 6	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

NOVELTY (N). INVENTIVE STEP (IS) Claims 1, 2, 5, 6

US 5448996 A (BELLIN et al.) 12 September 1995 - Figure 2; column 3, lines 47 - 61

US 4509527 A (FRADEN) 9 April 1985 - Figures 3 - 6; column 4, line 52 column 5, line 36

US 4376302 A (MILLER) 8 March 1983 - Figures 1, 2; column 2, lines 5 - 33

Each citation discloses a transducer comprising a piezoelectric member which deforms in use to provide an electric output, and first and second electrodes arranged on opposed sides of the piezoelectric member to pick up the electrical output, wherein the electrodes are offset so as to provide one or more regions in which the electrodes do not overlap. Each citation discloses a transducer wherein both electrodes are discontinuous when viewed along a planar cross-section taken across the electrodes and where the piezoelectric member comprises a sheet and the electrodes are arranged on opposed major faces of the sheet.

In response to the first opinion, the agent for the applicant has submitted as follows: "There is no disclosure in BELLIN et al of relatively offset electrodes arranged on opposite sides of a piezoelectric member. Furthermore the lower sensor segment 40 and the upper sensor segment 42 are completely overlapping. Therefore if a cut was taken across the monitor strip 32 there would be a risk of short-circuit between the upper and lower sensor segments. ... As described at column 5 lines 12 - 14 [of FRADEN] the electrodes on one surface are substantially directly aligned with electrodes on the opposite sides of the piezoelectric material. This is clearly shown in the cross section of figure 4. Therefore there is no offset between the electrodes. As a result, if a cut was taken across the electrodes (e.g. along the cross section of figure 4) there is a risk of short circuit between the upper and lower electrodes. FRADEN mentions at column 5 line 1 that one surface may have 'one common electrode'. However FRADEN does not describe the form of this 'common electrode'. ... As described in claim 1 (see column 6, lines 8,9) [of MILLER] the metallized strips are 'automatically and inherently' connected in series' between the terminals 60 and 62. Therefore if a cut was taken along the spaces 12, 14, 16, 18 or 20, this would break the series connection between the terminals 60, 62."

In light of the above submissions, the claimed invention is novel, involves an inventive step and is industrially applicable.

**A Transducer, a Method of Shaping a Transducer, and a Method of  
Monitoring a Subject**

5 The present invention relates to a novel transducer, a method of  
monitoring a human or animal subject, and a method of shaping a  
transducer. More particularly, but not exclusively, the present invention  
relates to a motion detecting transducer suitable for detecting the state of  
wakefulness of the driver of an automobile or for detecting the motion of a  
human (particularly an infant) during sleep.

10

In some applications where motion is required to be detected it is desirable  
to have a passive transducer, i.e. a transducer to which no power is  
supplied. Piezoelectric phenomena provide such an avenue in that the  
physical motion of the constituent material creates its own voltage.

15

A piezoelectric transducer is described in US-A-4359726. A polarised  
piezoelectric foil is contiguously enveloped by a pair of electrodes which  
are formed on the foil by a process of surface metalisation.

20

The arrangement of US-A-4359726 suffers from two problems. Firstly,  
due to the large area of the contiguous electrodes the capacitance between  
them is high. This high capacitance is a hindrance to the frequency  
response control of the transducer.

25

A second problem with the contiguous electrodes is that, if an end user  
needs to cut the transducer sheet to size to fit the transducer into a  
desired location (such as a vehicle seat or a baby's bassinet), a short  
circuit can be created between the electrodes since the piezoelectric film is  
very thin.

30

In accordance with a first aspect of the present invention there is provided  
a transducer comprising a piezoelectric member which deforms in use to  
provide an electrical output; a first electrode arranged on one side of the

1a

- 5 piezoelectric member and connected to a first output; and a second electrode arranged on an opposite side of the piezoelectric member and connected to a second output, wherein the electrodes are offset so as to provide one or more regions in which the electrodes do not overlap, wherein both electrodes are discontinuous when viewed along a planar cross-section taken across the electrodes, and wherein the electrodes are arranged so that they can be cut in the non-overlapping region(s) without creating a short circuit between the electrodes and without breaking the connections with the first or second outputs.

By offsetting the electrodes, the capacitance between the electrodes is reduced. The capacitance can also be conveniently controlled by selecting a suitable amount of offset between the electrodes. Furthermore, an end user can cut the transducer in the non-overlapping region(s) without  
5 creating a short circuit between the electrodes.

In most cases there will be at least some overlap between the electrodes, but an end user can be directed not to cut in the region of overlap, for instance by providing suitable indicia on the transducer. Typically the total  
10 area of overlap is less than 50% of the total combined area of the electrodes.

One or both electrodes may be formed in a variety of patterns which are discontinuous when viewed along a planar cross-section taken through the electrode(s). For instance the electrodes may comprise rectangular grids  
15 which are diagonally offset from each other. Alternatively the electrodes may be formed in offset serpentine patterns. This has the advantage that overlap can be completely avoided if required. In a further alternative the first electrode comprises a plurality of fingers; and the second electrode  
20 comprises one or more fingers arranged between the fingers of the first electrode.

The capacitance between the electrodes can be controlled by varying the width of the interlocking fingers and their degree of overlap. The fingers  
25 may have different widths, or the fingers of the first electrode may have a width substantially equal to the width of the finger(s) of the second electrode.

30

CLAIMS:

- 5 1. A transducer comprising a piezoelectric member which deforms in use to provide an electrical output; a first electrode arranged on one side of the piezoelectric member and connected to a first output; and a second electrode arranged on an opposite side of the piezoelectric member and connected to a second output, wherein the electrodes are offset so as to provide one or more regions in which the electrodes do not overlap,  
10 wherein both electrodes are discontinuous when viewed along a planar cross-section taken across the electrodes, and wherein the electrodes are arranged so that they can be cut in the non-overlapping region(s) without creating a short circuit between the electrodes and without breaking the connections with the first or second outputs.  
15
2. A transducer according to claim 1 wherein the electrodes are formed in offset serpentine patterns.
- 20 3. A transducer according to claim 1 wherein the first electrode comprises a plurality of fingers connected in parallel to the first output; and the second electrode comprises one or more fingers arranged between the fingers of the first electrode.
- 25 4. A transducer according to any one of the preceding claims wherein the first electrode covers a greater area than the second electrode.
5. A transducer according to claim 1 wherein the electrodes comprise diagonally offset rectangular grids.
- 30 6. A transducer according to any of the preceding claims wherein the piezoelectric member comprises a sheet and the electrodes are arranged on opposed major faces of the sheet.

7. A transducer comprising a piezoelectric member which deforms in use to provide an electrical output; first and second electrodes arranged on opposed sides of the piezoelectric member to pick up the electrical output; and a clamp for releasably securing the electrodes on each side of the piezoelectric member.

8. A transducer according to claim 7 wherein the piezoelectric member comprises a sheet and the electrodes are releasably secured on opposed major faces of the sheet.

9. A transducer according to claim 7 or 8 wherein the clamp is sprung so as to resiliently secure the electrodes.

10. A transducer according to any of claims 7 to 9 further comprising third and fourth electrodes arranged on opposed sides of the piezoelectric member to pick up the electrical output; a first layer of dielectric arranged between the first and third electrodes; and a second layer of dielectric arranged between the second and fourth electrodes, whereby the first and second electrodes couple capacitively with the second and third electrodes.

11. A subject support (such as a seat or bed) in combination with a transducer according to any of the preceding claims arranged in or on the subject support to detect signals from a subject occupying the subject support.

12. A method of shaping a transducer comprising a piezoelectric member which deforms in use to provide an electrical output; the method comprising manually cutting the transducer to a desired shape and size.

13. A method according to claim 12 wherein the piezoelectric member comprises a sheet.



14. A method according to claim 12 or 13 comprising cutting the transducer with a pair of scissors.

5 15. A method according to any of claims 12 to 14 comprising providing a transducer according to any of claims 1 to 6; and cutting through the region(s) of non overlap.

10 16. A method according to any of claims 12 to 15 further comprising placing the transducer in or on a subject support (such as a seat or bed).

17. A method according to any of claims 12 to 16 wherein the subject comprises an infant.

15 18. A method of monitoring a subject, the method comprising  
a) acquiring a movement signal from the subject;  
b) extracting vital sign information, from the movement signal;  
c) analyzing the vital sign information to determine the complexity of the vital sign information; and  
d) generating an alarm signal when the complexity falls below a  
20 predetermined threshold.

25 19. A method according to claim 18 wherein step b) comprises determining the fractal dimension of the movement signal, and wherein step c) comprises generating the alarm signal when the fractal dimension falls below a predetermined threshold.

30 20. A transducer according to any one of claims 1 to 6 wherein the total area of overlap is less than 50% of the total combined area of the electrodes.

21. A transducer according to claim 20 wherein there is substantially no overlap between the electrodes.

22. A transducer according to any one of claims 1 to 10, 20 or 21 wherein the piezoelectric member is dimensioned so as to be suitable for monitoring a human or animal subject.

AMENDED SHEET  
IPEA/AU